

**SELF-ALIGNED DOUBLE-GATE MOSFET BY SELECTIVE EPITAXY  
AND SILICON WAFER BONDING TECHNIQUES**

**ABSTRACT**

A structure and a method of manufacturing a double-gate metal oxide  
5 semiconductor transistor includes forming a laminated structure having a single  
crystal silicon channel layer and insulating oxide and nitride layers on each side of  
the single crystal silicon channel, forming openings in the laminated structure,  
forming drain and source regions in the openings, doping the drain and source  
regions, forming a mask over the laminated structure, removing portions of the  
10 laminated structure not protected by the mask, removing the mask and the  
insulating oxide and nitride layers to leave the single crystal silicon channel layer  
suspended from the drain and source regions, forming an oxide layer to cover the  
drain and source regions and the channel layer, and forming a double-gate  
conductor over the oxide layer such that the double-gate conductor includes a first  
15 conductor on a first side of the single crystal silicon channel layer and a second  
conductor on a second side of the single crystal silicon channel layer.